FIG. 1

Name	a	b	c	d	e	i	A	B	C	D	E	K	D-1	D0
D.0	0	1	1	0	0	0	0	0	0	0	0	0	+	-
D.0	1	0	0	1	1	1	0	0	0	0	0	0	-	+
D.1	1	0	0	0	1	0	1	0	0	0	0	0	+	-
D.1	0	1	1	1	0	1	1	0	0	0	0	0	-	+
D.2	0	1	0	0	1	0	0	1	0	0	0	0	+	-
D.2	1	0	1	1	0	1	0	1	0	0	0	0	-	+
D.3	1	1	0	0	0	1	1	1	0	0	0	0	x	0
D.4	0	0	1	0	1	0	0	0	1	0	0	0	+	-
D.4	1	1	0	1	0	1	0	0	1	0	0	0	-	+
D.5	1	0	1	0	0	1	1	0	1	0	0	0	x	0
D.6	0	1	1	0	0	1	0	1	1	0	0	0	x	0
D.7	1	1	1	0	0	0	1	1	1	0	0	0	-	0
D.7	0	0	0	1	1	1	1	1	1	0	0	0	+	0
D.8	0	0	0	1	1	0	0	0	0	1	0	0	+	-
D.8	1	1	1	0	0	1	0	0	0	1	0	0	-	+
D.9	1	0	0	1	0	1	1	0	0	1	0	0	x	0
D.10	0	1	0	1	0	1	0	1	0	1	0	0	x	0
D.11	1	1	0	1	0	0	1	1	0	1	0	0	x	0
D.12	0	0	1	1	0	1	0	0	1	1	0	0	x	0
D.13	1	0	1	1	0	0	1	0	1	1	0	0	x	0
D.14	0	1	1	1	0	0	0	1	1	1	0	0	x	0
D.15	1	0	1	0	0	0	1	1	1	1	0	0	+	-
D.15	0	1	0	1	1	1	1	1	1	1	0	0	-	+
D.16	0	1	1	0	1	1	0	0	0	0	1	0	-	+
D.16	1	0	0	1	0	0	0	0	0	0	1	0	+	-
D.17	1	0	0	0	1	1	1	0	0	0	1	0	x	0
D.18	0	1	0	0	1	1	0	1	0	0	1	0	x	0
D.19	1	1	0	0	1	0	1	1	0	0	1	0	x	0
D.20	0	0	1	0	1	1	0	0	1	0	1	0	x	0
D.21	1	0	1	0	1	0	1	0	1	0	1	0	x	0
D.22	0	1	1	0	1	0	0	1	1	0	1	0	x	0
D/K.23	1	1	1	0	1	0	1	1	1	0	1	x	-	+
D/K.23	0	0	0	1	0	1	1	1	1	0	1	x	+	-
D24	0	0	1	1	0	0	0	0	0	1	1	0	+	-
D24	1	1	0	0	1	1	0	0	0	1	1	0	-	+
D.25	1	0	0	1	1	0	1	0	0	1	1	0	x	0
D.26	0	1	0	1	1	0	0	1	0	1	1	0	x	0
D/K.27	1	1	0	1	1	0	1	1	0	1	1	x	-	+
D/K.27	0	0	1	0	0	1	1	1	1	0	1	x	+	-
D.28	0	0	1	1	1	0	0	0	1	1	1	0	x	0
K.28	0	0	1	1	1	1	0	0	1	1	1	1	-	+
K.28	1	1	0	0	0	0	0	0	1	1	1	1	+	-
D/K.29	1	0	1	1	1	0	1	0	1	1	1	x	-	+
D/K.29	0	1	0	0	0	1	1	0	1	1	1	x	+	-
D/K.30	0	1	1	1	1	0	0	1	1	1	1	x	-	+
D/K.30	1	0	0	0	0	1	0	1	1	1	1	x	+	-
D.31	1	0	1	0	1	1	1	1	1	1	1	0	-	+
D.31	0	1	0	1	0	0	1	1	1	1	1	0	+	-

FIG. 2

Name	f	g	h	j	F	G	H	K	D-1	D0
D/K.x.0	0	1	0	0	0	0	0	x	+	-
D/K.x.0	1	0	1	1	0	0	0	x	-	+
D/K.x.1	1	0	0	1	1	0	0	x	x	0
K.28.1	0	1	1	0	1	0	0	1		0
D/K.x.2	0	1	0	1	0	1	0	x	x	0
K.28.2	1	0	1	0	0	1	0	1		0
D/K.x.3	1	1	0	0	1	1	0	x	-	0
D/K.x.3	0	0	1	1	1	1	0	x	+	0
D/K.x.4	0	0	1	0	0	0	1	x	+	-
D/K.x.4	1	1	0	1	0	0	1	x	-	+
D/K.x.5	1	0	1	0	1	0	1	x	x	0
K.28.5	0	1	0	1	1	0	1	1		0
D/K.x.6	0	1	1	0	0	1	1	x	x	0
K.28.6	1	0	0	1	0	1	1	1		0
D.x.7	1	1	1	0	1	1	1	0	-	+
D.x.7	0	0	0	1	1	1	1	0	+	-
D/K.x.7	0	1	1	1	1	1	1	x	-	+
D/K.x.7	1	0	0	0	1	1	1	x	+	-

FIG. 3

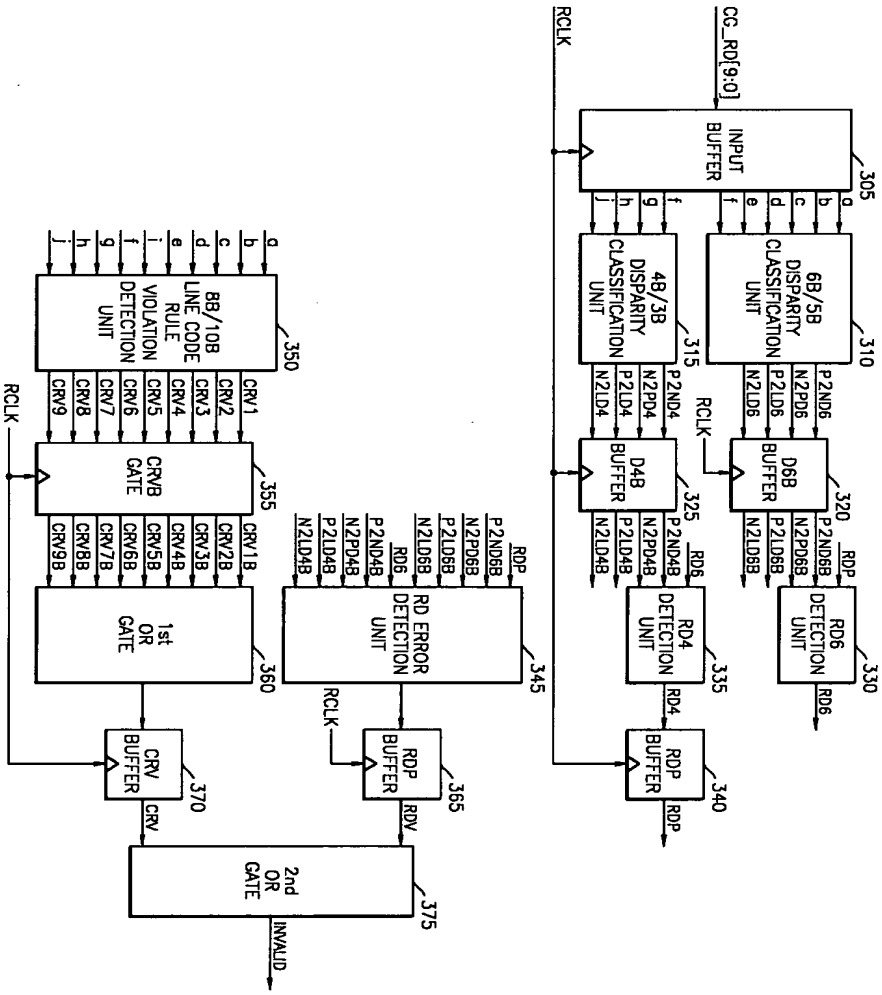

CG_RD[9:0]
INPUT BUFFER
305
RCLK
6B/5B DISPARITY CLASSIFICATION UNIT
310
4B/3B DISPARITY CLASSIFICATION UNIT
315
D6B BUFFER
320
D4B BUFFER
325
RD6 DETECTION UNIT
330
RD4 DETECTION UNIT
335
RDP BUFFER
340
RD ERROR DETECTION UNIT
345
RDP BUFFER
365
8B/10B LINE CODE RULE VIOLATION DETECTION UNIT
350
CRV8B GATE
355
1st OR GATE
360
CRV BUFFER
370
2nd OR GATE
375
INVALID

FIG. 4

Name	Disparity class
P2ND6	(P22*(e')*(i')) OR (P13*(e')) OR (P13(i'))
N2PD6	(P22*e*i) OR (P31*e) OR (P31*i)
P2LD6	P13*d*e*i
N2LD6	P31*(d')*(e')*(i')

Note. 1. * : Logical AND
2. ' : Logical NOT
3. ^ : Logical Exclusive-OR
4. P22 = ((a*b)*((c')*(d'))) OR ((c*d)*((a')*(b'))) OR ((a^b)*(c^d))
5. P13 = ((a^b)*((c')*(d'))) OR ((c^d)*((a')*(b')))
6. P31 = ((a^b)*c*d) OR ((c^d)*a*b)

FIG. 5

Name	Disparity class
P2ND4	((f')*(h')*(j')) OR ((f')*(g')*(j')) OR ((f')*(g')*(h')) OR ((g')*(h')*(j'))
N2PD4	(f*h*j) OR (f*g*j) OR (f*g*h) OR (g*h*j)
P2LD4	(f')*(g')*h*j
N2LD4	f*g*(h')*(j')

Note. 1. * : Logical AND
2. ' : Logical NOT

FIG. 6A

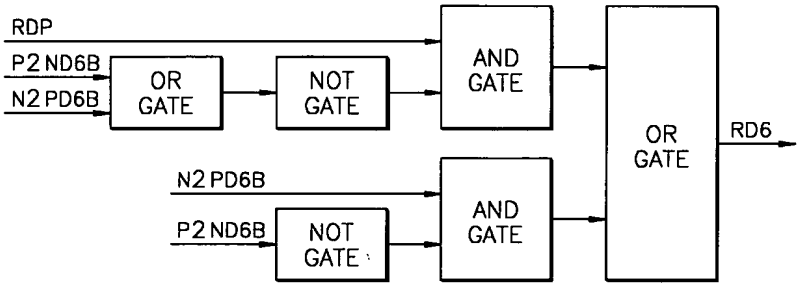

RDP
P2 ND6B
N2 PD6B
OR GATE
NOT GATE
AND GATE
N2 PD6B
P2 ND6B
NOT GATE
AND GATE
OR GATE
RD6

FIG. 6B

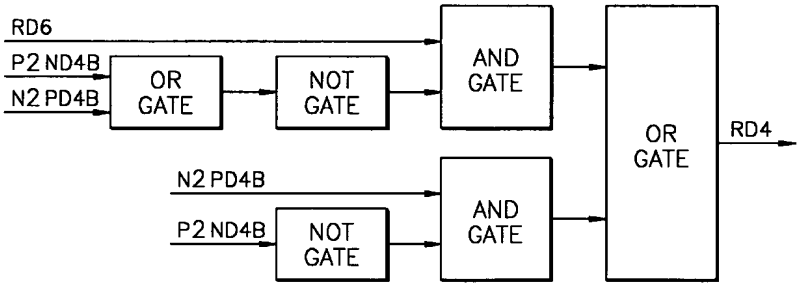

RD6
P2 ND4B
N2 PD4B
OR GATE
NOT GATE
AND GATE
N2 PD4B
P2 ND4B
NOT GATE
AND GATE
OR GATE
RD4

FIG. 7

Name	Running Disparity Violation Class
RDV1	P2ND6B*(RDP')
RDV2	N2PD6B*RDP
RDV3	P2LD6B*(RDP')
RDV4	N2LD6B*RDP
RDV5	P2ND4B*(RD6')
RDV6	N2PD4B*RD6
RDV7	P2LD4B*(RD6')
RDV8	N2LD4B*RD6

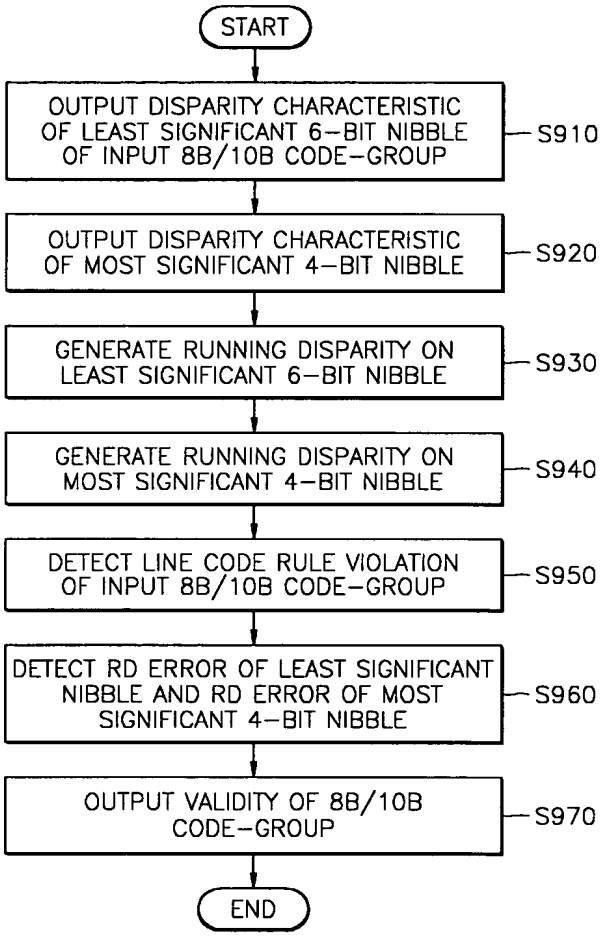
Note. 1. * : Logical AND
2. ' : Logical NOT

FIG. 8

Name	8B/10B Line-Coding Rule Violation Class
CRV1	a = b = c = d
CRV2	P13*(e')*(i')
CRV3	P31*e*i
CRV4	f = g = h = j
CRV5	e = i = f = g = h
CRV6	i^(e = g = h = j)
CRV7	((e = i)^(g = h = j))*((c = d = e)')
CRV8	(P31')*e*(i')*(g')*(h')*(j')
CRV9	(P13')*(e')*i*g*h*j

Note. 1. * : Logical AND
2. ' : Logical NOT
3. ^ : Logical Exclusive-OR
4. P22 = ((a*b)*((c')*(d'))) OR ((c*d)*((a')*(b'))) OR ((a^b)*(c^d))
5. P13 = ((a^b)*((c')*(d'))) OR ((c^d)*((a')*(b')))
6. P31 = ((a^b)*c*d) OR ((c^d)*a*b)

FIG. 9


START
OUTPUT DISPARITY CHARACTERISTIC OF LEAST SIGNIFICANT 6-BIT NIBBLE OF INPUT 8B/10B CODE-GROUP
S910
OUTPUT DISPARITY CHARACTERISTIC OF MOST SIGNIFICANT 4-BIT NIBBLE
S920
GENERATE RUNNING DISPARITY ON LEAST SIGNIFICANT 6-BIT NIBBLE
S930
GENERATE RUNNING DISPARITY ON MOST SIGNIFICANT 4-BIT NIBBLE
S940
DETECT LINE CODE RULE VIOLATION OF INPUT 8B/10B CODE-GROUP
S950
DETECT RD ERROR OF LEAST SIGNIFICANT NIBBLE AND RD ERROR OF MOST SIGNIFICANT 4-BIT NIBBLE
S960
OUTPUT VALIDITY OF 8B/10B CODE-GROUP
S970
END